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# บทบาทของกิจกรรมนันทนาการและการใช้เวลาว่าง ในการส่งเสริมกิจกรรมทางกายและลดพฤติกรรมเนือยนิ่ง

# THE ROLE OF RECREATION AND LEISURE ACTIVITIES IN PROMOTING PHYSICAL ACTIVITY AND REDUCING SEDENTARY BEHAVIOUR

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## บทคัดย่อ

การส่งเสริมกิจกรรมทางกายมักมุ่งเน้นไปที่การออกกำลังกายและกีฬาที่มีรูปแบบชัดเจน อย่างไรก็ตาม เวลาว่างเป็นหนึ่งในหลายมิติของชีวิตประจำวัน นอกเหนือจากการทำงาน การเดินทาง และงานบ้าน ที่บุคคลสามารถเลือกเคลื่อนไหวร่างกายได้ด้วยตนเอง บทความปริทัศน์เชิงพรรณนานี้ สังเคราะห์หลักฐานจากการสืบค้นวรรณกรรมอย่างมีโครงสร้าง เพื่ออธิบายว่ากิจกรรมนันทนาการและการใช้เวลาว่างมีบทบาทในการส่งเสริมกิจกรรมทางกายและลดพฤติกรรมเนือยนิ่งได้อย่างไร บทความนี้จำแนกความแตกต่างระหว่างนันทนาการโดยทั่วไป ซึ่งครอบคลุมทั้งกิจกรรมที่มีการเคลื่อนไหวร่างกายและกิจกรรมเนือยนิ่งกับนันทนาการเชิงรุก อธิบายความสัมพันธ์แบบซ้อนทับกันระหว่างกิจกรรมทางกาย กิจกรรมทางกายในเวลาว่าง นันทนาการเชิงรุก การออกกำลังกาย และกีฬา และระบุกลไก 6 ประการที่กิจกรรมนันทนาการเชิงรุกอาจช่วยลดอุปสรรคต่อการมีกิจกรรมทางกาย ได้แก่ การสร้างโอกาสในการเคลื่อนไหวที่เข้าถึงได้ ความสนุกสนานและแรงจูงใจภายในการมีส่วนร่วมของสังคมและครอบครัว การปรับรูปแบบให้สอดคล้องกับวัยและสมรรถภาพที่แตกต่างกัน การสะสมกิจกรรมทางกายนอกบริบทการออกกำลังกายที่เป็นทางการ และการเข้าถึงบุคคลกลุ่มอื่นนอกเหนือจากผู้ที่ออกกำลังกายเป็นประจำ จากนั้น บทความนี้ได้จำแนกความแตกต่างระหว่างการขาดกิจกรรมทางกายและพฤติกรรมเนือยนิ่ง พร้อมทั้งนำเสนอว่านันทนาการเชิงรุกอาจช่วยทั้งสร้างการเคลื่อนไหวและทดแทนพฤติกรรมการนั่งเนือยนิ่ง หลักฐานซึ่งส่วนใหญ่มาจากการศึกษาเชิงสังเกตบ่งชี้ว่า กิจกรรมทางกายระดับเบามีความสัมพันธ์กับความเสี่ยงในการเสียชีวิตที่ลดลงและตัวชี้วัดด้านระบบหัวใจหลอดเลือดและเมแทบอลิซึมบางประการที่ดีขึ้น โดยเฉพาะอย่างยิ่งเมื่อใช้ทดแทนช่วงเวลาที่มีพฤติกรรมเนือยนิ่ง อย่างไรก็ตาม กิจกรรมดังกล่าวต้องใช้เวลามากกว่า และมิได้เทียบเท่ากับกิจกรรมทางกายระดับปานกลางถึงหนักในทุกมิติ โดยเฉพาะด้านสมรรถภาพทางกาย ภาวะไขมันสะสม และผลลัพธ์ทางระบบหัวใจและหลอดเลือด บทความนี้จึงเสนอแนวทางความต่อเนื่อง 3 ระดับ ซึ่งปรับประยุกต์จากแนวทางแบบขั้นบันได ได้แก่ การลดเวลาว่างที่มีพฤติกรรมเนือยนิ่ง การเพิ่มเวลาว่างเชิงรุกในภาพรวม และการเพิ่มความหนักของกิจกรรมเมื่อสามารถทำได้ ท้ายที่สุด บทความนี้นำเสนอเป็นข้อเสนอเชิงนโยบาย ซึ่งแยกจากข้อสรุปเชิงประจักษ์ว่าสมาคมวิชาชีพและวิชาการด้านนันทนาการสามารถมีบทบาทในงานด้านสาธารณสุขผ่านบทบาทสำคัญ 5 ประการ ได้แก่ การผลักดันนโยบาย การแปลงหลักฐานเชิงประจักษ์สู่การปฏิบัติ การพัฒนาศักยภาพกำลังคน การประสานความร่วมมือข้ามภาคส่วน และการประเมินผล ทั้งนี้ บริการด้านนันทนาการควรได้รับการพิจารณาให้เป็นองค์ประกอบสำคัญของระบบกิจกรรมทางกายในระดับประชากร

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## Abstract

The promotion of physical activity has traditionally concentrated on structured exercise and sports; however, discretionary leisure time is one of several domains, alongside work, transport, and household tasks, in which people can choose to move. This narrative review synthesises evidence identified through structured literature searches to examine how recreation and leisure activities contribute to promoting physical activity and reducing sedentary behaviour. It first distinguishes recreation in general, which includes both physically active and sedentary pursuits, from active recreation, describes the overlapping relationships among physical activity, leisure-time physical activity, active recreation, exercise, and sport, and identifies six mechanisms through which active recreation may lower barriers to movement: accessible opportunities, enjoyment and intrinsic motivation, social and family participation, adaptability to different ages and capacities, accumulation of activity outside formal exercise settings, and reach beyond self-identified exercisers. It subsequently differentiates physical inactivity from sedentary behaviour and contends that active recreation can both introduce movement and replace sitting-based sedentary behaviour. Predominantly observational evidence indicates that light-intensity activity is associated with lower mortality risk and more favourable cardiometabolic markers, especially when it replaces sedentary time. However, comparable associations require considerably more time than moderate-to-vigorous physical activity (MVPA), and such activity is not equivalent to MVPA for fitness, adiposity, and cardiovascular outcomes. A three-level continuum adapted from the Staircase Approach is proposed: reduce sedentary leisure, increase total active leisure, and increase intensity where feasible. Finally, as policy recommendations rather than empirically established conclusions, the review proposes five functions through which professional and academic recreation associations could act in public health: policy advocacy, translation of evidence, workforce capacity development, cross-sector collaboration, and evaluation. Recreation services should be regarded as an integral component of a population-wide physical activity system.

**Keywords:** Active recreation, Physical activity, Sedentary behaviour, Professional associations

## Introduction

Physical activity is defined as any bodily movement produced by skeletal muscles that results in energy expenditure (Borodulin & Anderssen, 2023; Bull et al., 2020). It occurs across multiple domains, including occupation, active transport, household tasks, education, and leisure, and therefore extends well beyond structured exercise and organised sports (Reyes-Molina et al., 2025). Nevertheless, public discourse and professional practice often continue to equate “being active” primarily with exercise training, gym-based activity, or competitive sport, overlooks the diverse ways in which people accumulate movement throughout daily life, including incidental and unstructured activities that may contribute meaningfully to cardiometabolic health and lower mortality risk (Reyes-Molina et al., 2025).

The World Health Organization (WHO) 2020 guidelines provide the current global benchmark for physical activity and sedentary behaviour. Adults are recommended to do 150–300 minutes of moderate-intensity aerobic physical activity, 75–150 minutes of vigorous-intensity aerobic physical activity, or an equivalent combination each week, along with muscle-strengthening activities on two or more days per week. Children and adolescents are recommended to accumulate an average of at least 60 minutes per day of moderate-to-vigorous physical activity (MVPA) across the week (Bull et al., 2020; Chaput et al., 2020). Importantly, the guidelines also introduced explicit recommendations to limit sedentary behaviour and


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emphasised that replacing sedentary time with physical activity of any intensity, including light-intensity activity, provides health benefits (Bull et al., 2020). The broader messages that some physical activity is better than none and that additional activity can provide further health benefits support an active-living approach in which movement is accumulated across daily life, rather than an approach centred exclusively on structured exercise (Borodulin & Anderssen, 2023; Bull et al., 2020).

Active recreation, the physically active component of recreation and leisure, occupies a distinctive position within this active-living model because it is typically voluntary, adaptable, and less constrained by the competitive, skill-related, or financial barriers associated with traditional sport (Wang et al., 2026). In Australia, for example, 71% of health-enhancing leisure-time activities took place in non-organised settings and only 18% in sport clubs (Eime et al., 2015). Parks, community spaces, and leisure programmes may further broaden access by providing opportunities for older adults, people with disabilities, and other groups who face structural barriers to participation in commercial or formal exercise settings (Ranasinghe et al., 2025). Despite this potential, active recreation remains underutilised as a setting for population-level physical activity promotion.

Existing reviews have generally addressed single strands of this topic, such as park interventions, light-intensity activity, or sedentary behaviour interventions (Chastin et al., 2019; Derose et al., 2021; Segura-Jiménez et al., 2022), without separating recreation-specific from general physical activity evidence or considering how recreation organisations might act on it. This review therefore examines how recreation relates to exercise and sport, through which mechanisms active recreation may increase physical activity and reduce sedentary behaviour, whether it must reach moderate-to-vigorous intensity, and what roles recreation associations could play in physical activity policy. Its contribution is a synthesis that distinguishes direct, setting-level, and indirect evidence, a movement continuum adapted to leisure settings, and an implementation agenda for recreation associations.

## Review Methods

A narrative review was chosen because the topic spans epidemiology, behavioural science, leisure studies, and policy, and the relevant studies are too heterogeneous to pool. Structured searches of Scopus, PubMed/MEDLINE, and Web of Science were conducted in May and June 2026. They were supplemented by Google Scholar and by backward and forward citation tracking of key reviews and consensus statements. Search terms combined recreation terms (recreation, active recreation, leisure, parks) with outcome terms (physical activity, sedentary behaviour, light-intensity activity, isotemporal substitution, mortality, cardiometabolic health, mental health) and with policy. The searches covered publications from January 2015 to June 2026; earlier sources were included when they remained the principal definitional, guideline, or trial reference. During manuscript preparation and revision, supplementary targeted searches using Google Scholar and forward citation tracking of key sources were conducted through October 2026; these searches were intended to identify relevant recent evidence rather than to replicate the full database search strategy. One study identified through this process was published after the main search period (Martínez-Redecillas et al., 2026; online publication 4 August 2026) and was included because it provided directly relevant evidence on recreation and sedentary time among young people.

Eligible sources were English-language peer-reviewed publications of the following types: systematic, scoping, and umbrella reviews; meta-analyses, including systematic reviews, meta-analyses, pooled cohort analyses, controlled trials; primary observational studies, namely prospective cohort studies and multi-site, population-based, or consortium-based cross-sectional studies; and policy documents, plus


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one Thai-language national policy analysis for local context. Primary observational studies were included when they provided recreation-specific, setting-specific, or device-measured estimates not available from reviews (e.g., Eime et al., 2015; Schipperijn et al., 2017; Watts et al., 2022; Blodgett et al., 2024). Narrative reviews, conceptual papers, systems-mapping studies, and position statements or grey literature from WHO and professional organisations were used to inform definitions, mechanisms, and policy arguments rather than estimates of effect.

They had to address physical activity or sedentary behaviour in leisure contexts or provide the general evidence on which recreation recommendations depend. Reviews and studies using device-measured activity were given priority. Evidence was synthesised thematically around the four review questions set out in the Introduction. Each key source was classified by study design and by directness: direct evidence examined participation in recreation or leisure-time activity specifically; setting-level evidence examined recreational environments, such as parks or facilities, but measured physical activity in total or within the setting without identifying recreational participation; and indirect evidence concerned physical activity in general. No formal risk-of-bias assessment or meta-analysis was undertaken. Table 2 summarises the principal sources.

## Recreation and Leisure within the Physical Activity Concept

Recreation in general is broader than physical activity. It includes any freely chosen leisure pursuit, from sedentary activities such as reading, television viewing, video gaming, board games, and spectating to physically active pursuits such as walking, dancing, and informal sport; WHO guidelines accordingly treat recreational screen time as sedentary behaviour to be limited (Chaput et al., 2020). Only its physically active component, active recreation, can be positioned within the broader concept of physical activity as a form of discretionary movement. In this review, “active recreation” is used whenever recreation is discussed as physical activity, whereas “recreation” without qualification refers to the broader field, including recreation settings and services. The related constructs, however, overlap rather than nest neatly, because each is defined by a different criterion: domain, purpose, structure, or rules (Caspersen et al., 1985).

1) *Physical activity* is the broadest category and refers to any bodily movement produced by skeletal muscles that results in energy expenditure across leisure, transport, household, occupational, and educational domains (Borodulin & Anderssen, 2023; Bull et al., 2020).

2) *Leisure-time physical activity* refers to physical activity that involve movement of at least light intensity and are undertaken during discretionary time, outside obligatory occupational, educational, household, or transport-related activities (Miller et al., 2024). Seated recreational pursuits, such as reading or screen-based entertainment, fall outside this category and constitute sedentary leisure.

3) *Active recreation* comprises leisure-time activities undertaken primarily for enjoyment, social interaction, restoration, cultural participation, or engagement with nature. Examples include recreational walking, hiking, dancing, and gardening (Borodulin & Anderssen, 2023; Miller et al., 2024).

4) *Exercise* is typically planned, structured, and repetitive, aimed at improving or maintaining physical fitness or performance (Caspersen et al., 1985); it usually occurs in leisure time but can also occur in occupational or rehabilitation settings.

5) *Sport* generally involves organised activities governed by rules and may include competition (Reyes-Molina et al., 2025); it may be leisure, compulsory school sport, or paid work.


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This distinction is not merely semantic. Structured activities typically feature explicit goals, formal instruction, and some supervision, whereas unstructured recreation emphasises autonomy, enjoyment, social interaction, and the opportunities afforded by the surrounding environment (Wang et al., 2026). The categories therefore intersect recreational jogging is both exercise and recreation, informal games are both sport and recreation, and dance or community-based sport, may fall within either category depending on how they are organised and delivered (Wang et al., 2026). Table 1 summarises the main settings and distinguishing characteristics of these forms of activity.

**Table 1.** Defining criteria and overlaps among physical activity constructs

| Construct | Defining criterion | Examples | Main overlaps |
|---|---|---|---|
| **Physical activity** | Any energy-expending movement, in any domain | Commuting, housework, play | Includes all constructs below |
| **Leisure-time physical activity** | Domain: discretionary time | Walking for pleasure, club sport | Includes most recreation and much exercise and sport |
| **Active recreation** | Purpose: enjoyment, social contact, restoration, nature; movement of at least light intensity | Hiking, dancing, gardening | Overlaps exercise (recreational jogging) and sport (informal games) |
| **Exercise** | Planned, repetitive, fitness-oriented | Gym training | Also occurs in occupational or rehabilitation settings |
| **Sport** | Rules, often competition | Leagues, school sport, pickup games | Leisure, education, or paid work |

**Note.** Adapted from Caspersen et al. (1985), Bull et al. (2020), and Wang et al. (2026). Recreation in general also includes sedentary activity (e.g., reading, screen-based entertainment, spectating), which fall outside physical activity and are therefore not shown.

WHO recognises that active living can be accumulated through a wide range of activities, including walking, cycling, play, gardening, dance, sport, and other forms of active recreation (Bull et al., 2020; World Health Organization, 2018). The domain in which physical activity occurs may also influence its health effects. Leisure-time physical activity is generally associated with more favourable cardiovascular and mental health outcomes, whereas occupational physical activity does not appear to confer the same cardiovascular benefits (Holtermann et al., 2018). Similarly, a review of 372 studies found that leisure-time physical activity was positively associated with mental health, while work-related physical activity was positively associated with mental ill-health (Teychenne et al., 2026). Although correlational, these findings support recognising leisure-time physical activity, including active recreation, as a legitimate physical activity domain with potentially distinctive health and social benefits and therefore support the inclusion of recreation professionals and organisations within the broader physical activity promotion system.


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## Recreation and Leisure as Opportunities for Increasing Physical Activity

Active recreation may contribute substantially to total physical activity by reducing some of the barriers that make conventional exercise programmes difficult to initiate or sustain. Parks, natural environments, multipurpose leisure centres, and community spaces can encourage movement through autonomous, enjoyable, and socially supportive participation rather than through formal instruction or obligation (Heckel et al., 2024; Maddock & Frumkin, 2025; Müller et al., 2024). Six mechanisms are particularly relevant. The strength and directness of the evidence differ across them: direct evidence on recreational participation exists mainly for the fourth; evidence for the first is largely setting-level, linking recreational environments to physical activity measured in total; and the others rest largely on evidence about leisure-time activity in general.

*Creating accessible opportunities for movement.* The availability, proximity, and quality of recreational spaces can influence the amount of leisure-time physical activity people accumulate. Across 12 cities in eight countries, residents of neighbourhoods with the highest park density accumulated approximately 24 more minutes per week of accelerometer-measured MVPA than those living in areas with the lowest park density, although this cross-sectional association may reflect residential self-selection (Schipperijn et al., 2017). Similar associations have been reported for access to recreational facilities and trails in rural populations (Müller et al., 2024). Because Schipperijn et al. (2017) measured total MVPA without recording where or in which domain it occurred, such findings show that recreational environments are associated with how active residents are, not that the additional activity was accumulated through recreational participation in those settings.

*Facilitating enjoyable and intrinsically motivated activity.* Because recreational participation is typically voluntary, it can support enjoyment, perceived competence, autonomy, and social connection (Teychenne et al., 2026), which may help explain the more favourable mental-health associations of leisure-time activity noted above.

*Increasing social and family participation.* Shared family, community, and intergenerational recreation may strengthen social relationships, reinforce positive attitudes towards movement, and provide opportunities to remain active across different stages of life (Sanz Arazuri & Ponce de León Elizondo, 2025; Sharifi et al., 2023). Such opportunities may be particularly important during life transitions, including retirement, when occupational movement often declines.

*Accommodating different ages and functional capacities.* Recreation can be adapted to individual abilities and preferences. In a meta-analysis of 74 trials in adults with physical or intellectual disabilities, physical recreation, mostly traditional Chinese exercise, yoga, and dance, improved mobility and balance, although with low to very low certainty (Hassett et al., 2024). Preferences for recreational activity also vary by age, gender, culture, and functional capacity, so flexible recreation settings may be more responsive than standardised exercise programmes (Martín-Martínez et al., 2026; Sentell et al., 2026).

*Allowing physical activity to accumulate outside formal exercise settings*. Recreational activities such as walking, gardening, and other forms of unstructured movement allow activity to accumulate activity throughout daily life without requiring participation in formal exercise sessions and may be easier for some populations to sustain than highly structured programmes (Reyes-Molina et al., 2025).

*Reaching people who do not identify as exercisers or athletes.* Public and low-cost recreational opportunities may engage individuals who are unlikely to participate in gyms, organised sport, or formal exercise programmes. When designed with affordability and community access in mind, recreation may therefore contribute to reducing socioeconomic inequalities in opportunities for physical activity (Høyer-Kruse et al., 2024).


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However, these opportunities are not distributed equally. Observational studies indicate that young people are often among the most active users of parks, whereas older adults remain comparatively underrepresented (Evenson et al., 2016). People with disabilities and those from lower-income groups may also face inaccessible facilities, inadequate transport, financial constraints, and other structural barriers to participation (Høyer-Kruse et al., 2024; Martin Ginis et al., 2016). The contribution of recreation to population physical activity therefore depends not only on the availability of recreational opportunities, but also on whether those opportunities are deliberately designed to be accessible, inclusive, and equitable.

For population health, the critical question is therefore not only whether individuals participate in exercise or sport, but also whether their leisure environments provide regular, accessible, and meaningful opportunities to move.

## Recreation as a Strategy for Reducing Sedentary Behaviour

Recreation is not inherently active: many leisure pursuits, such as television viewing, video gaming, and other screen-based entertainment, are undertaken while sitting, and WHO guidelines recommend limiting recreational screen time in children and adolescents (Chaput et al., 2020). It is therefore active recreation, rather than recreation in general, that can contribute to reducing sedentary behaviour, but this requires sedentary behaviour to be treated as a distinct behavioural target rather than simply the absence of sufficient physical activity. Physical inactivity generally refers to not meeting recommended levels of MVPA, whereas sedentary behaviour is defined as any waking behaviour characterised by an energy expenditure of ≤1.5 metabolic equivalents (METs) while sitting, reclining, or lying (Panahi & Tremblay, 2018; Prince et al., 2014). Consequently, an individual may meet MVPA recommendations while still accumulating substantial amounts of sedentary time.

Active recreation can therefore influence movement behaviour through two complementary pathways: *adding physical activity* and *displacing sedentary time*. The latter is relevant even when the replacement activity remains below moderate intensity. Isotemporal substitution analyses, which model statistical rather than observed reallocation of time, suggest that replacing sedentary time with light-intensity activity is associated with lower all-cause mortality and more favourable metabolic outcomes, while replacement with MVPA is generally associated with larger and broader cardiometabolic benefits (Del Pozo-Cruz et al., 2018). Prolonged, uninterrupted sitting has also been associated with impaired vascular function and higher blood pressure, whereas interrupting sedentary time with movement may produce acute cognitive and physiological benefits (Beecroft et al., 2026; Feter et al., 2024).

Conceptually, leisure behaviour can be viewed along a movement continuum:

*Sedentary leisure* ⟶ *light active leisure* ⟶ *moderate active recreation* ⟶ *vigorous recreation*

This continuum highlights that meaningful behavioural change does not always require an immediate transition from sitting to structured exercise. Practical substitutions may include replacing television viewing with gardening, sitting-based socialising with recreational walking, or passive sightseeing with walking-based tourism. In a review of 13 studies of young people, outdoor and active-tourism programmes were associated with sitting reductions of 20–30 min/day in short-term interventions and up to 1.5–2 h/day in immersive camps, although most designs were short-term (Martínez-Redecillas et al., 2026). Similarly, access to green space and walkable neighbourhoods has also been associated with lower levels of leisure-time sitting (O'Donoghue et al., 2016), while restrictions on access to recreational


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environments during the COVID-19 pandemic coincided with substantial increases in sedentary time (Stockwell et al., 2021); however, because these restrictions also affected work, schooling, and transport, the increase cannot be attributed to reduced recreational access alone.

However, displacement of sedentary time should not be assumed to occur automatically when physical activity increases. In controlled trials in adults, physical activity interventions reduced sedentary time by about 19 min/day, compared with about 91 min/day for interventions targeting sedentary behaviour, partly because compensatory reductions in activity occur outside exercise sessions when sitting is not explicitly targeted (Prince et al., 2014). Even effective sedentary behaviour interventions shift sitting mainly toward standing and light-intensity ambulation rather than MVPA (Segura-Jiménez et al., 2022).

Recreation should therefore be evaluated not only according to whether an activity reaches an MVPA threshold, but also according to the behaviour it replaces and the extent to which it improves the overall composition of daily movement.

## Does Active Recreation Need to Be Moderate-to-Vigorous ?

Active recreation does not need to reach moderate-to-vigorous intensity to be associated with health benefits, although MVPA remains more time-efficient and produces a stronger physiological stimulus for several outcomes (Ekelund et al., 2019; Tarp et al., 2024). Most evidence in this section is indirect: it comes from device-measured light-intensity activity and MVPA in any domain, because accelerometers do not record whether movement was recreational, and it applies to active recreation by extension. Recreation-specific evidence is identified separately where available. This section considers why intensity matters, what light-intensity activity contributes, and the extent to which greater duration can compensate for lower intensity.

### Intensity within physical activity guidelines

Physical activity intensity is commonly expressed in METs, with light activity generally defined as 1.6–2.9 METs, moderate activity as 3.0–5.9 METs, and vigorous activity as ≥6 METs (Bull et al., 2020). WHO recommendations of 150–300 minutes of moderate-intensity or 75–150 minutes of vigorous-intensity aerobic activity per week reflect an approximate two-to-one equivalence between these intensity levels (Bull et al., 2020). Intensity is physiologically important because higher exercise intensities impose greater cardiovascular, respiratory, and metabolic demands and can therefore provide a stronger stimulus for adaptations such as improved cardiorespiratory fitness. Light-intensity activity generally provides a smaller stimulus for these adaptations.

### Health value of light-intensity recreational activity

Light-intensity activity is nevertheless associated with meaningful health benefits, particularly when it replaces sedentary behaviour. In a harmonised meta-analysis of 36,383 adults with device-measured physical activity, participants in the highest quartile of light activity had substantially lower mortality risk than those in the lowest quartile (Ekelund et al., 2019). Among 46,682 older adults, total movement volume was more strongly associated with lower mortality than the proportion of that volume accumulated as MVPA, highlighting the potential importance of overall activity volume in later life (Tarp et al., 2024), and associations for light activity persisted after adjustment for MVPA (Ku et al., 2020). Residual confounding and reverse causation may nonetheless inflate these cohort estimates (Ekelund et al., 2019).

Experimental evidence further supports the value of replacing sedentary time with light movement. In acute laboratory studies, interrupting prolonged sitting with frequent short bouts of light activity can reduce postprandial glucose by 17.5% and insulin responses by 25.1% compared with continuous sitting (Chastin et al., 2019). Similarly, modelled reallocation of 30 min/day of sedentary time to light-intensity


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activity has been associated with more favourable waist circumference, fasting insulin, and mortality outcomes (Del Pozo-Cruz et al., 2018). Among highly sedentary individuals, greater volumes of light-intensity movement may also attenuate some of the excess mortality risk associated with prolonged sitting (Ekelund et al., 2020).

**Can duration compensate for lower intensity ?**

Physical activity dose can be considered broadly in terms of the combined contribution of intensity, duration, and frequency. From this perspective, a prolonged period of light recreational activity may generate a total volume or energy expenditure comparable with that of a shorter period of MVPA. However, similar activity volumes do not necessarily produce equivalent physiological adaptations or health effects.

Evidence suggests that an intensity–duration trade-off exists, but only to a limited extent.

*Time required.* In the same harmonised analysis, the maximal reduction in mortality risk was observed at approximately 375 min/day of light-intensity activity, compared with only about 24 min/day of MVPA, illustrating the greater time efficiency of higher-intensity activity (Ekelund et al., 2019, 2024). In highly sedentary adults, about 30–40 min/day of MVPA attenuated the excess mortality risk associated with sitting (Ekelund et al., 2020).

*Cardiometabolic outcomes.* In cross-sectional analyses from the ProPASS consortium involving 15,253 adults, reallocating as little as 4–13 min/day of sedentary time to MVPA was associated with more favourable cardiometabolic markers. For example, a 5% lower body mass index was associated with reallocating approximately 65 min/day to MVPA, compared with about 1.8 h/day to light-intensity activity (Blodgett et al., 2024).

*Adiposity in young people.* Reallocating sedentary time to MVPA has generally been associated with more favourable adiposity outcomes than reallocating the same amount of time to light-intensity activity (García-Hermoso et al., 2017).

*Cardiovascular and inflammatory outcomes.* Among older adults, substitution of sedentary time with MVPA appears to produce stronger associations with vascular, autonomic, and inflammatory markers than substitution with light-intensity activity (Sun et al., 2026).

*Recreation-specific evidence.* Among 272,550 adults aged 59–82 years, meeting guidelines through any combination of seven leisure activities was associated with 13% lower mortality, with the largest reductions for racquet sports (16%) and running (15%) (Watts et al., 2022); because activity was self-reported and healthier people may choose more vigorous pursuits, these differences are not necessarily causal.

The appropriate interpretation is therefore not that greater duration of light activity is equivalent to MVPA: **Longer durations of lower-intensity activity can increase total physical activity volume and may partly compensate for lower intensity for some health outcomes, particularly when they replace sedentary time; however, light-intensity activity should not be considered universally equivalent to MVPA.**

Physiological responses depend not only on total activity volume but also on the intensity, mode, and specific stimulus provided by the activity. Several hours of recreational walking, gardening, or low-intensity outdoor activity can generate substantial energy expenditure and replace considerable sedentary time. However, these activities may not provide the same cardiorespiratory or metabolic stimulus as appropriately prescribed MVPA. For recreation and leisure promotion, the practical message is therefore: **Move more, sit less, and include higher-intensity activity when feasible.** This framing is consistent with WHO's population-wide approach, which recognises that some physical activity is better than none while also encouraging progression toward recommended levels of moderate- and vigorous-intensity activity (Bull et al., 2020; World Health Organization, 2018).


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**Table 2.** Summary of key evidence by design, population, measurement, findings, and limitations

| Source | Design and population | Measurement | Main finding | Directness; limitation |
|---|---|---|---|---|
| 1. Schipperijn et al. (2017) | Cross-sectional; adults, 12 cities in 8 countries | GIS; accelerometer | +24 min/week MVPA, highest vs lowest park density | Direct; Setting-level; self-selection |
| 2. Derose et al. (2021) | Review of 27 park intervention studies | Observation; surveys | Renovations increased park use and PA; programming effects smaller | Direct; Setting-level; few controlled designs |
| 3. Hassett et al. (2024) | Meta-analysis of 74 RCTs; 2,954 adults with disability | Functional tests | Improved mobility, with a small-to-moderate effect size; better balance | Direct; low certainty |
| 4. Martínez-Redecillas et al. (2026) | Review of 13 studies; about 3,100 youth aged 6–20 years | Device; self-report | Sitting time was reduced by 20–30 min/day in short programmes and by 1.5–2 h/day in camp-based programmes | Direct; short-term designs |
| 5. Watts et al. (2022) | Cohort; 272,550 US adults aged 59–82 years | Self-report | Mortality −13% if guidelines met; racquet sports −16%, running −15% | Direct; healthy-participant bias |
| 6. Ekelund et al. (2019) | Harmonised meta-analysis; 8 cohorts, 36,383 adults | Accelerometer | Higher light activity was associated with 62% lower mortality, with maximal benefit at about 375 min/day versus 24 min/day of MVPA | Indirect; reverse causation |
| 7. Blodgett et al. (2024) | Cross-sectional; 15,253 adults, 6 cohorts | Accelerometer | 5% lower BMI was associated with about 65 min/day of MVPA versus 1.8 h/day of light activity. | Indirect; modelled reallocation |

**Note.** Direct = participation in recreation or leisure-time activity examined specifically; setting-level = recreational environments examined, with physical activity measured in total or within the setting rather than as recreational participation; indirect = physical activity in any domain. BMI = body mass index; GIS = geographic information system; PA = physical activity; RCT = randomised controlled trial.

The evidence also differs across age groups and settings. In young people, MVPA rather than light activity is associated with adiposity (García-Hermoso et al., 2017), whereas in older adults total volume and light activity carry relatively greater weight (Tarp et al., 2024). Because most studies come from high-income countries, effect sizes may not transfer directly to settings such as Thailand.

## From Exercise Prescription to Recreation-Based Movement Opportunities

A recreation-based approach offers a graded continuum of participation, allowing individuals to begin at a level that reflects their current capacity, preferences, and circumstances. Conventional exercise prescription typically defines a target dose of activity and evaluates progress in relation to that target. For


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people who are physically inactive, older, living with disability or chronic conditions, or simply uninterested in formal exercise, an immediate emphasis on meeting prescribed thresholds may be difficult to adopt or sustain (Ranasinghe et al., 2025). A recreation-based framework can therefore provide more flexible entry points and support gradual progression towards greater activity. Table 3 presents a three-level model based on this approach.

**Table 3.** A recreation-based movement continuum

| Level | Aim | Shift | Example indicator |
|---|---|---|---|
| 1: Reduce sedentary leisure | Break up and replace sitting | Sedentary ⟶ light movement | Daily sedentary leisure time; breaks in sitting |
| 2: Increase total active leisure time | Accumulate more movement | Short or light ⟶ longer or more frequent light activity | Weekly minutes of active leisure |
| 3: Increase intensity where feasible | Add a fitness stimulus | Light ⟶ moderate ⟶ vigorous | Weekly MVPA minutes; physical fitness |

**Note.** Adapted by the author from the Staircase Approach (Katsoulis et al., 2025), Borodulin and Anderssen (2023), Bull et al. (2020), and Wang et al. (2026).

The continuum adapts the "Staircase Approach" proposed for older adults, in which Step 1 targets sedentary behaviour and Steps 2–4 add activity of increasing intensity (Katsoulis et al., 2025). It extends that approach to leisure settings across the life course, treats the leisure behaviour being displaced as a target of change, and attaches an indicator to each level (Table 3). It is inclusive, because individuals can enter at a level that reflects their current ability, motivation, health status, and environmental opportunities. It is also cumulative, as each level builds on rather than replaces the one below. Progression towards higher levels of activity is encouraged, but meaningful health and behavioural benefits can still be gained at each stage. The framework is conceptual and has not been empirically validated; its effects should be tested in intervention studies.

This framework also connects recreation directly with the four strategic objectives of the WHO Global Action Plan on Physical Activity 2018–2030: *active societies, active environments, active people,* and *active systems* (World Health Organization, 2018). Recreation services can help shape social norms around active leisure and participation (active societies), provide access to parks, trails, and recreational facilities (active environments), and deliver inclusive programmes that enable people to be more active (active people). Professional and academic organisations in recreation and leisure can further contribute to active systems by supporting workforce development, evidence translation, cross-sector collaboration, policy advocacy, and programme evaluation.

## The Policy Role of Professional and Academic Associations in Recreation and Leisure

This review proposes that professional and academic organisations in recreation and leisure should be recognised as public-health actors, rather than viewed solely as bodies concerned with recreational programming, professional development, or leisure studies. Systems-based models of active recreation already identify recreation organisations, sport bodies, and leisure agencies as macro-level actors in efforts to address physical inactivity (Koorts et al., 2022). Similarly, the WHO Global Action Plan on Physical Activity


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(GAPPA) calls for multisectoral collaboration and coordinated systems that expand opportunities for physical activity across communities (World Health Organization, 2018). However, community clubs and local recreation organisations remain underused as explicitly recognised health-promoting assets within national policy frameworks (Brazier et al., 2024). Professional and academic associations in recreation and leisure are well positioned to help address this gap because they can connect research, professional practice, community implementation, and policymaking. Their contribution can be organised into five interconnected functions. These are policy recommendations rather than empirically established conclusions, as evaluations of association activity remain scarce; Table 4 outlines how each could be implemented and evaluated.

**Policy advocacy and agenda setting**

Professional associations can advocate for greater recognition of recreation and leisure within national physical activity and noncommunicable disease prevention strategies. Key priorities include equitable access to parks and recreational spaces, investment in community recreation infrastructure, inclusive active-leisure programmes for underserved groups, integration of recreation into health and urban policy, and sustained funding for local services. The National Recreation and Park Association (NRPA) in the United States provides one example of this role through advocacy for funding and legislation that support equitable access to green space and recreational opportunities (NRPA, n.d.-a). In this capacity, professional associations can function as policy intermediaries, translating practitioner experience and community needs into policy priorities while communicating policy developments back to the field.

**Translating evidence into policy and practice**

Academic and professional associations can synthesise research into position statements, consensus statements, practice guidelines, policy briefs, evidence summaries, and implementation toolkits. This function is important because much of the evidence on physical activity is generated within public health, epidemiology, and exercise science, whereas implementation often occurs in parks, community centres, tourism settings, and leisure services. Multi-level frameworks describing how leisure participation may influence health can provide a theoretical basis for policy and investment decisions (Fancourt et al., 2021). Associations can also translate emerging evidence, including the contribution of light-intensity activity and sedentary-time displacement discussed in the previous section, into practical guidance for programme design and delivery.

**Building professional capacity**

Associations can strengthen the competencies of recreation and leisure professionals in physical activity promotion, sedentary behaviour reduction, inclusive programme design, behaviour-change strategies, evaluation and measurement, health equity, and policy advocacy. This role is particularly important where professional standards and credentialing remain fragmented or where practitioners have limited recognition within formal health systems, as has been reported in related fitness professions (Neville & Armour, 2017). The NRPA Park Champion initiative illustrates one approach to capacity building by training members to use data and storytelling, build inclusive coalitions, and engage consistently with elected officials (NRPA, n.d.-b). Such initiatives extend professional development beyond programme delivery towards broader roles in advocacy, communication, and community health leadership.

**Building cross-sector partnerships**

Recreation and leisure associations can also act as conveners across public health, sport, education, urban planning, tourism, local government, transport, and environmental sectors. This coordinating role is important because opportunities for active recreation depend on decisions made across multiple systems rather than within the recreation sector alone. Community leisure agencies may, for example, connect


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formal health services with local opportunities through leisure education, referral pathways, and recreation navigation for older adults and retirees (Hutchinson & Kleiber, 2023). By creating shared agendas, terminology, and implementation networks across sectors, associations can support the whole-of-system approach advocated in GAPPA (World Health Organization, 2018).

**Surveillance, evaluation, and accountability**

Recreation and leisure programmes are not always evaluated using standardised indicators or outcome frameworks, limiting their ability to demonstrate population-level effects (Brazier et al., 2024). Professional and academic associations could help establish common indicators covering participation rates, active recreation time, sedentary leisure time, activity intensity and duration, access to parks and facilities, inequalities in participation, device-measured physical activity, programme reach, implementation quality, and policy-level change. Developing common evaluation standards would allow the sector to move beyond reporting how many programmes were delivered towards demonstrating whether, for whom, and under what conditions programmes changed population movement behaviour.

**Table 4.** Proposed implementation guidance for the five functions of recreation associations

| Function | Lead and partners | Implementation steps | Resources | Evaluation indicators |
|---|---|---|---|---|
| Policy advocacy | Associations; ministries; local government | Prepare policy briefs; seek inclusion in national physical activity and NCD plans | Policy staff; local access data | Recreation named in policy; recreation budget |
| Evidence translation | Academic associations; universities | Issue position statements and toolkits on replacing sedentary leisure | Expert panels | Guidance issued and adopted |
| Workforce capacity | Associations; training institutions | Add physical activity and sedentary behaviour content to curricula and continuing education | Training modules; accreditation | Staff trained; competencies assessed |
| Cross-sector partnership | Associations; health, education, planning, tourism agencies | Form joint committees and referral pathways | Coordinator time; data sharing | Active partnerships; referrals completed |
| Evaluation | Associations; researchers; statistical agencies | Agree core indicators and embed them in routine monitoring | Surveys; devices; data systems | Reach; active and sedentary leisure time; participation gaps |

**Note.** NCD = noncommunicable disease

## From Recreation Services to Active-Living Systems: Policy Implications

The central policy shift is from providing recreation activities to building an active-leisure system. Systems-based approaches recognise that population physical inactivity cannot be addressed by any single sector; rather, leisure and recreation infrastructure should be considered alongside transport, education, health, and urban planning as part of the wider physical activity system (McLaughlin et al., 2025; Reis et al., 2016). In one network analysis of a youth active-recreation system, more than 125 organisations were identified across multiple administrative levels, with the built and natural environments emerging as important leverage points for system-wide change (Koorts et al., 2022). Figure 1 illustrates how research evidence can be translated through professional organisations, policy, environments, and programmes into opportunities for active leisure and, ultimately, population health. It is a conceptual model, not an empirically validated pathway.


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Empirical support varies across this pathway. The downstream links are better established: park renovations have generally been associated with increased park use and physical activity, although the effects of programming appear more modest and the evidence remains limited (Derose et al., 2021; Zhang et al., 2022). These are setting-level findings: increased activity within a renovated park may partly reflect activity displaced from other places, so they do not by themselves show a net increase in recreational participation or total physical activity. The association between physical activity and health is supported by a large body of evidence, although much of it is observational (Table 2). By contrast, the upstream links connecting research, professional associations, and policy are supported mainly by case studies and systems-based models (Brazier et al., 2024; Koorts et al., 2022). At the policy level, the US Community Preventive Services Task Force recommends multicomponent strategies that combine improvements to transport systems with enhanced access to parks and recreational spaces (Omura et al., 2020). However, the distribution of benefits depends on how such policies are designed. Infrastructure investment alone may disproportionately benefit more advantaged groups, whereas pairing environmental improvements with subsidised or otherwise accessible programming may help reduce socioeconomic inequalities in participation (Heuvelman et al., 2026).




**Figure 1.** From research evidence to population health through an active-leisure system.

**Note.** Developed by the author based on Koorts et al. (2022), McLaughlin et al. (2025), Reis et al. (2016), and World Health Organization (2018). Evidence status: effects of environments and programmes on physical activity are supported by intervention studies, and activity–health links by mainly observational evidence; upstream links from research to policy are proposed.


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Professional organisations could therefore help reframe recreation infrastructure as preventive public-health infrastructure. The NRPA position statement on health and well-being advances this perspective by calling for expanded public access to physical activity opportunities through park and recreation agencies, supported by appropriate policy and funding (NRPA, n.d.-c). A persistent challenge, however, is governance, as cross-sector collaboration can become fragmented by differences in administrative responsibility, institutional priorities, and funding arrangements (McLaughlin et al., 2025). Professional associations can help address this fragmentation by convening relevant sectors, clarifying shared responsibilities, and establishing common indicators for monitoring progress and accountability. Parks, recreation services, and leisure programmes should therefore be regarded as integral components of a population physical activity system, alongside transport, education, sport, and health-sector interventions.

International models should be transferred with caution because recreation systems vary substantially across countries. The NRPA operates within a context of dedicated municipal park and recreation agencies, whereas in many settings recreation is delivered through local administrations, schools, and community organisations. Thailand's Physical Activity Strategy 2018–2030 already incorporates the principles of active people, active places, and active supporting systems, but implementation has been constrained by persistent emphasis on elite sport, limited technical capacity, and the absence of a comprehensive monitoring and evaluation system (Topothai, 2021). In this context, recreation associations may contribute most effectively by strengthening workforce capacity, supporting cross-sector coordination, and developing shared indicators within existing institutional structures.

## Limitations

This review has several limitations. As a narrative review, it did not involve exhaustive searching, duplicate screening, or formal risk-of-bias assessment, and the evidence base may therefore overrepresent prominent English-language publications. In addition, studies published after the June 2026 database searches were identified only through targeted supplementary searches and citation tracking, so recent publications may be incompletely captured. Recreation was often assessed by self-report, whereas physical activity intensity and sedentary time were frequently measured using devices that lacked information on behavioural domain; consequently, several recreation-specific conclusions rely on indirect evidence. Similarly, several studies of recreational settings, such as parks, measured physical activity in total or within the setting; they provide evidence about recreational environments rather than direct evidence of participation in recreational activities. Much of the outcome evidence is observational and remains susceptible to residual confounding, reverse causation, and healthy-participant bias, while isotemporal substitution models estimate statistical reallocations rather than directly observed behavioural changes. In addition, most studies were conducted in high-income countries, which may limit generalisability to Thailand and other settings with different recreation systems and policy structures. Finally, the proposed continuum, Figure 1, and the suggested roles of professional and academic associations are conceptual and require empirical evaluation.

## Conclusion

Recreation and leisure may contribute to population physical activity at three interconnected levels. **Individual:** active recreation provides enjoyable, voluntary, and accessible opportunities to move, including for people who may not identify as exercisers or athletes. **Behavioural:** active recreation can increase total physical activity while also displacing sedentary behaviour, even when specific activities do


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not consistently reach MVPA intensity. Longer durations of light-intensity activity can increase total movement volume and reduce sedentary time but should not be regarded as universally equivalent to MVPA; higher-intensity activity remains important where feasible. **Systems and policy:** professional and academic organisations in recreation and leisure can help translate these opportunities into population-level impact through evidence translation, workforce development, policy advocacy, cross-sector collaboration, and evaluation.

The future of physical activity promotion should extend beyond participation in sport and structured exercise. Recreation and leisure represent an important but underused component of the broader physical activity system because they shape how discretionary time is spent, whether leisure is predominantly sedentary or active, and whether movement can be integrated into everyday life. Professional and academic organisations in recreation and leisure could therefore play an important role not only in supporting recreational opportunities, but also in shaping policy, translating evidence into practice, strengthening professional capacity, and advocating for environments in which active leisure is accessible, inclusive, and socially normative.

## Author Contributions

The sole author was responsible for conceptualizing the article, reviewing and synthesizing the literature, developing the conceptual framework, and drafting and revising the manuscript. The author's contributions are classified according to the Contributor Roles Taxonomy (CRediT), as presented in the table below. The author assumes full responsibility for the accuracy of the article's content.

| Name of Author | C | M | So | Va | Fo | I | R | D | O | E | Vi | Su | P | Fu |
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| Songdhasn Chinapong | ✓ | | | ✓ | | | | | ✓ | ✓ | | | | |

C : **C**onceptualization
M : **M**ethodology
So : **So**ftware
Va : **Va**lidation
Fo : **Fo**rmal analysis
I : **I**nvestigation
R : **R**esources
D : **D**ata Curation
O : Writing - **O**riginal Draft
E : Writing - Review & **E**diting
Vi : **Vi**sualization
Su : **Su**pervision
P : **P**roject administration
Fu : **Fu**nding acquisition

## Conflicts of Interest

The author declares no conflicts of interest. This work received no specific funding from any public, commercial or not-for-profit agency. The author has no affiliation with, or financial interest in, any organisation named in this article.

## Declaration of AI Use

During preparation of this manuscript, the author used generative artificial intelligence tools to assist with language editing, improve clarity and coherence, refine academic phrasing, and organise the presentation of ideas. The authors independently reviewed, verified, and revised all AI-assisted content and take full responsibility for the accuracy, interpretation, and integrity of the final manuscript. Generative artificial intelligence was not used to generate research data, perform data analysis, or make decisions regarding the interpretation of scientific evidence.


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